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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,041	02/16/2001	Yoichi Mizuno	0033-0693P	2528

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EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 05/13/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/784,041

Applicant(s)

MIZUNO, YOICHI

Examiner

Justin R Fischer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,5. 6) ☐ Other:

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori (JP 09302155) in view of Majumdar (US 5,503,940). Hattori discloses a gum chafer rubber composition for use in heavy-duty tires (Column 3, Lines 9-11) comprising natural rubber and synthetic rubber in a ratio between (6:4) and (3:7). The reference further suggests that carbon black having a nitrogen adsorption specific surface area of less than 130 m²/g (preferably 40-120 m²/g) is included in an amount between 70 and 100 phr (Column 4, Examples 2 and 1-2 show embodiments in which all limitations are satisfied). However, in describing the use of additives, Hattori is completely silent with respect to the use of 1,3-bis (citraconimidomethyl) benzene or BCI in an amount between 0.2 and 0.5 phr. Majumdar, though, describes the use of bis-imide compounds in an amount between 0.1 and 5 phr, and specifically BCI [Tradename: Perkalink 900], in tire rubber components in order to improve blowout resistance, reduce heat generation, improve durability, and reduce reversion (Column 2, Lines 27-54 and

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Column 3, Lines 13-21). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the chafer rubber composition of Hattori with 1,3-bis (citraconimidomethyl) benzene in an amount between 0.2 and 0.5 phr, as suggested by Majumdar, as set forth below.

Regarding claims 1 and 3, as previously stated, Hattori describes a chafer rubber composition that is extremely similar to that of the claimed invention, including its use in heavy-duty tires (Column 3, Lines 9-11: example tire size is 11R22.5). Furthermore, Hattori describes the use of additives to the chafer rubber composition, such as vulcanization agents, vulcanization accelerators, vulcanization aids, and additional additives (Column 3, Lines 40+). Although Hattori is silent to the use of BCI in an amount between 0.2 and 0.5 phr, anti-reversion agents are conventionally employed in tire components, especially those containing natural rubber, in order to eliminate the reduction in crosslink density and ultimately increase the strength and durability of the respective tire component. Majumdar suggests the use of BCI in an amount between 0.1 and 5 phr in order to, among other things, reduce heat generation, improve durability, and reduce reversion, all of which are known to be desired characteristics of rubber chafer compositions (Column 3, Lines 13-21). Thus, in view of these benefits, one of ordinary skill in the art at the time of the invention would have readily appreciated the employment of BCI in the chafer rubber of Hattori since (a) anti-reversion agents are conventionally used in tire rubber components and (b) said benefits are analogous to the well known and desired properties of rubber chafer compositions. It should be noted that although Majumdar is primarily directed to a composition in the carcass/tread region (cushion layer), the reference in no way suggests that the benefits of BCI are

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specific to these tire components and as such, one of ordinary skill in the art at the time of the invention would have readily appreciated the use of BCI in a chafer rubber composition for the reasons detailed above.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori and Majumdar as applied to claim 1 above, and further in view of Sandstrom (US 5,885,389). Hattori and Majumdar teach a chafer rubber composition for heavy-duty tires comprising natural rubber, butadiene rubber, carbon black, and BCI in accordance to the limitations of the claimed invention. The reference, however, is silent as the presence of sulfur and thus necessarily fails to suggest a ratio of S/A between 0.25 and 0.5, where S is the sulfur content and A is the accelerator content. In any event, sulfur is conventionally used as a vulcanizing agent/aid in all tire components, including chafer rubbers. Sandstrom suggests a rubber composition for chafer rubbers and describes the use of "commonly used additive materials, such as sulfur", specifying an amount between 0.5 and 2.25 phr. Thus, in view of Sandstrom, it would have been obvious to one of ordinary skill in the art at the time of the invention to include sulfur in the claimed range, as set forth below.

With respect to claim 2, applicant requires that the amount of sulfur between 0.25 and 0.5 times the amount of accelerator. As previously stated, Hattori generally suggests the use of conventional additives, such as softening agents, aging prevention agents, and vulcanization agents, accelerators, and aids. In suggesting "vulcanization agents", one of ordinary skill in the art at the time of the invention would have readily appreciated and expected such language of Hattori as being directed to conventional and well-known agents, such as sulfur, as evidence by Sandstrom (Column 3, Lines 49-

55). Thus, although not expressly stated, one of ordinary skill in the art at the time of the invention would have recognized the chafer rubber of Hattori as having sulfur and accelerator. Furthermore, sulfur and accelerator are known to be used in an amount that ranges between 0 and 5 phr. For example, Sandstrom suggests a preferred sulfur content of between 0.5 and 2.25 phr (Column 4, Lines 30-35) and an accelerator content of between 0.5 and 2.0 phr (Column 4, Lines 38-41). Also, Sandstrom suggests the use of a multi-part accelerator system in which the amount of sulfur would be slightly greater. Thus, it is evident that Hattori is directed to a plurality of embodiments, including those in which the claimed ratio would be satisfied. One of ordinary skill in the art at the time of the invention would have been able to optimize the chafer rubber composition by varying the well-known and conventional additives in accordance to the limitations of the claimed invention and in accordance to the desired properties (both uncured and cured).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Watanabe (JP 10000902) teaches a chafer rubber composition in heavy-duty tires comprising natural rubber, butadiene rubber, carbon black, sulfur, and accelerators, among other additives. In this instance, several embodiments are detailed in which natural rubber and butadiene are incorporated in equivalent amounts (50 phr) and carbon black (HAF) is used in an amount equal to 72 phr, as required by the claimed invention. Takahashi (JP 11059142) discloses a chafer rubber composition for heavy-duty tires in which natural rubber is added in an amount between 70 and 20 phr, butadiene rubber is added in amount between 30 and 80 phr, and carbon black is

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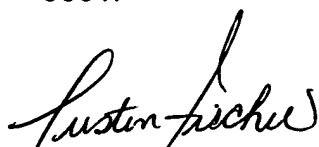
added in amount between 60 and 90 phr. Nakajima (JP 02219834) teaches a chafer rubber composition formed of natural rubber, butadiene rubber, and carbon black.


Furthermore, the reference describes the carbon black as having a cetyltrimethylammonium bromide adsorption specific surface area of 130-150 m²/g and a dibutyl phthalate adsorption of less than 130 ml/g. Datta (RD 430048) describes the use of BCI as an alternative crosslinking agent for zinc-oxide-cured halobutyl rubbers useful for tires, such as innerliners. Anon (RD 393049) suggests the use of BCI in place of sulfur for improving aged flex life and specifically suggest the use of BCI in an amount of 0.25, 0.50, and 0.75 phr.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(703) 605-4397**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Justin Fischer


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700

May 8, 2002